

MOBILE POSITIONING DATA: A NEW DATA SOURCE FOR MEASURING Population Mobility



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Feasibility on using

BIG DATA

For Official Statistics



1.96.4 per 100 inhabitants mobile phone subscription world wide.

2. Every mobile phone user leaves a digital footprint that we can learn about the pattern.

BPS' initiatives **With Big Data for Official Statistics**



Foreign Tourists at Cross Border Posts



Domestic Visitors



Commuting Statistics



Event based analysis

- **Asian Games**
- **IMF-WB annual meeting**

Foreign Tourists at Cross Border Posts



CROSS BORDER



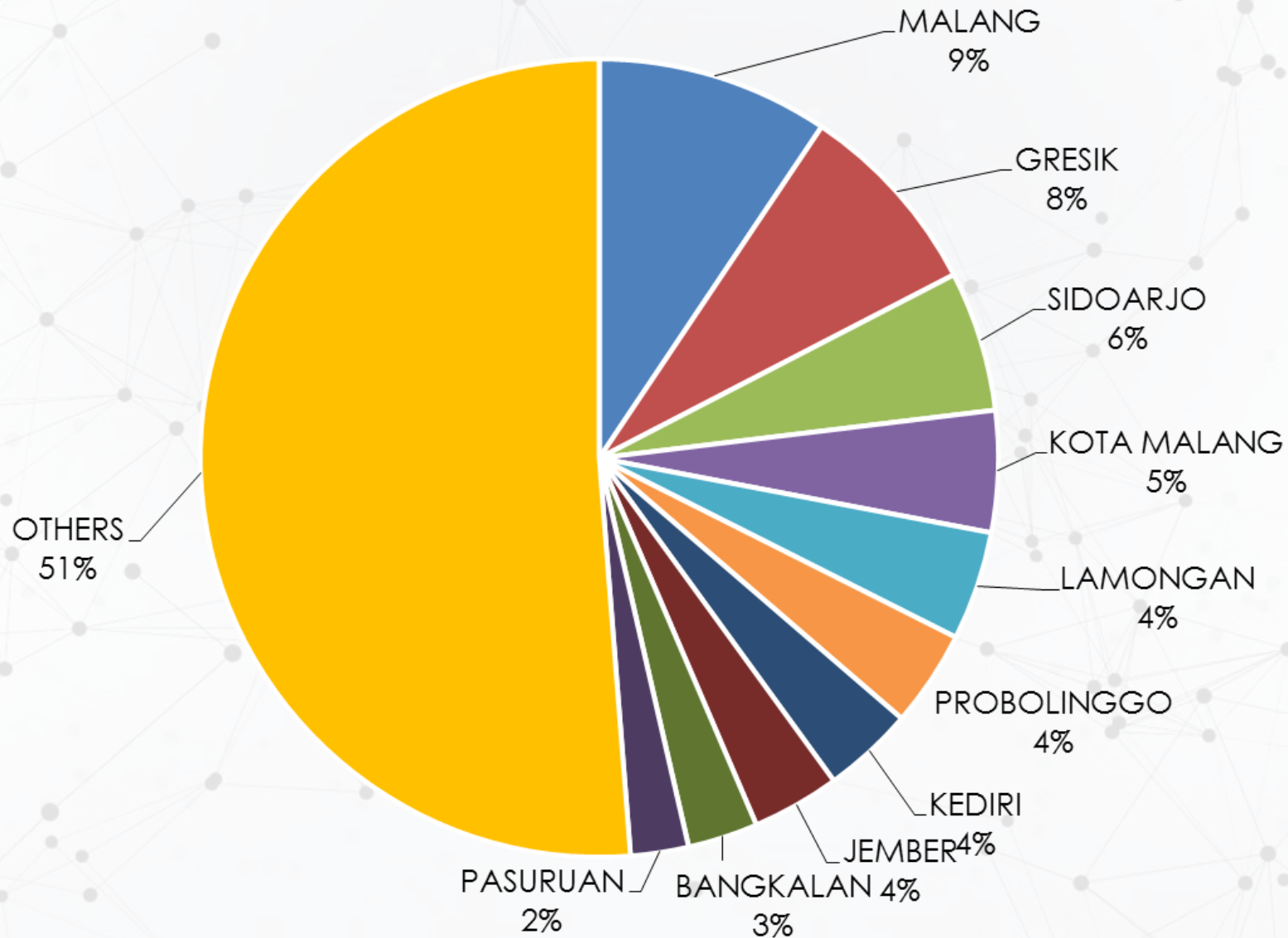
DAY 1 – 19



INTERNATIONAL
VISITOR

Origin of Domestic Tourist to Surabaya

Domestic Tourists
Statistics



**Event Based
Analyses**

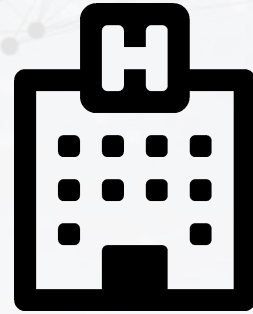
ASIAN GAMES | 2018
Jakarta Palembang



ANNUAL MEETINGS
2018 | indonesia
INTERNATIONAL MONETARY FUND
WORLD BANK GROUP

BPS' initiatives

With Big Data for Official Statistics



- 
-  Foreign Tourists at Cross Border Posts
 -  Domestic Visitors
 -  Commuting Statistics
 -  Event based analysis
 - Asian Games
 - IMF-WB annual meeting

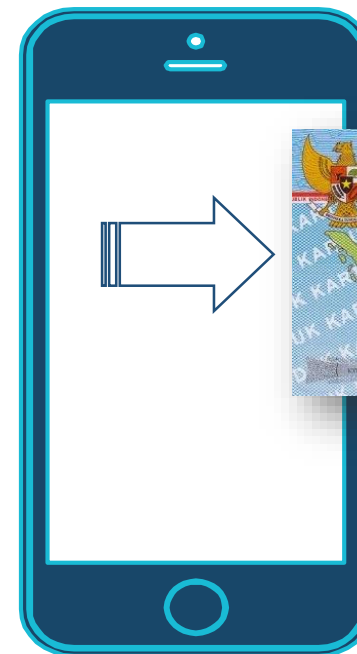
MIGRATION STATISTICS





Mobile Positioning Data
(MPD)

3 Quick Facts of Mobile Positioning Data (MPD) in Indonesia

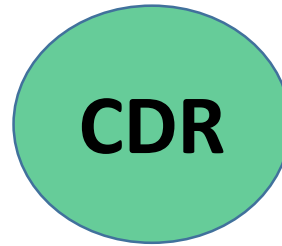
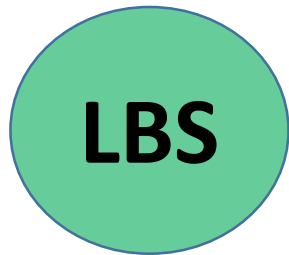


**All numbers have to
register based on
Single Identification
Number as in the
personal ID Card**

Data Sources



TELKOMSEL



- MoU
- Buy the services

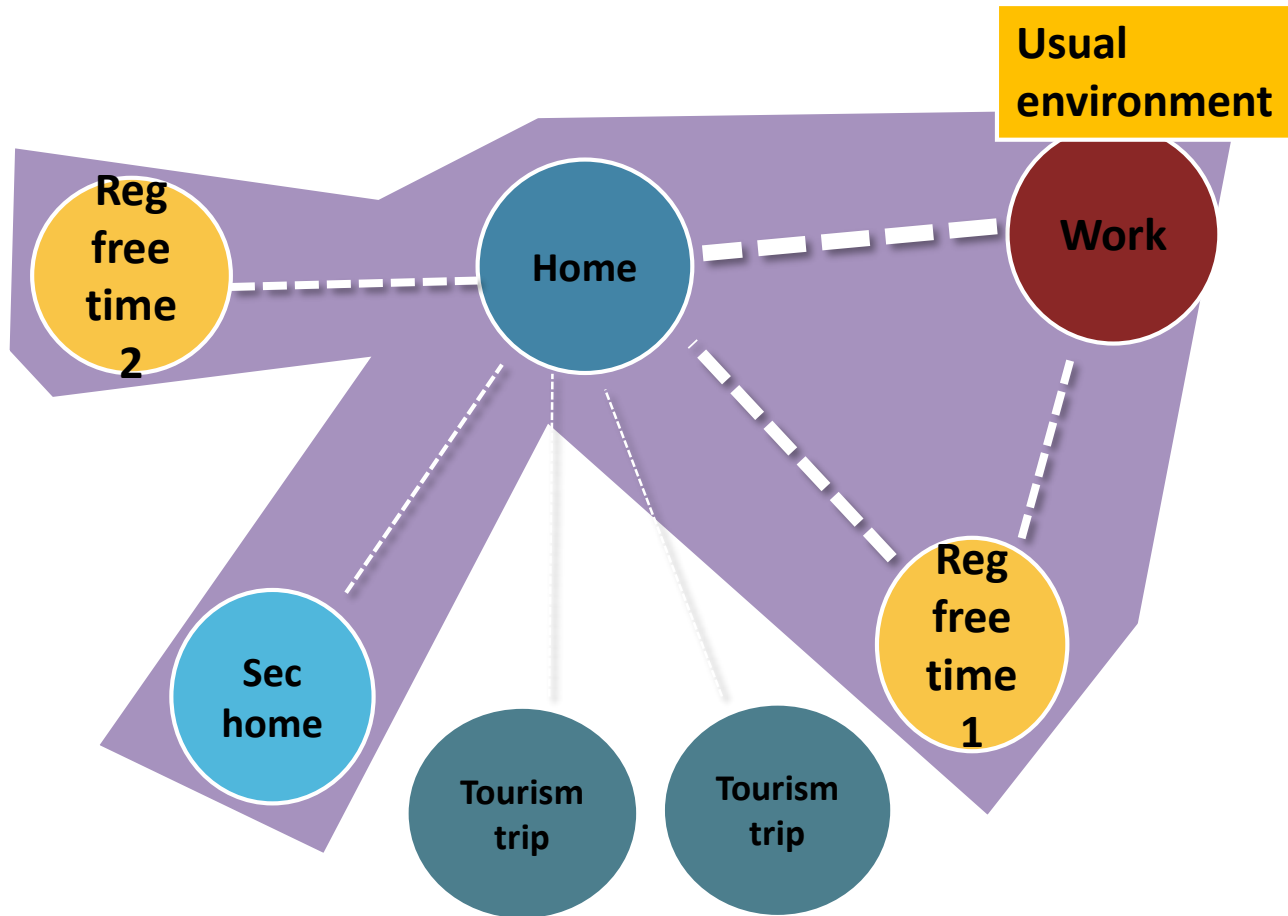
Location Based Service (LBS) :

based on geo-data to calculate the presence of cellular subscriber in particular area

Call Detailed Record (CDR) :

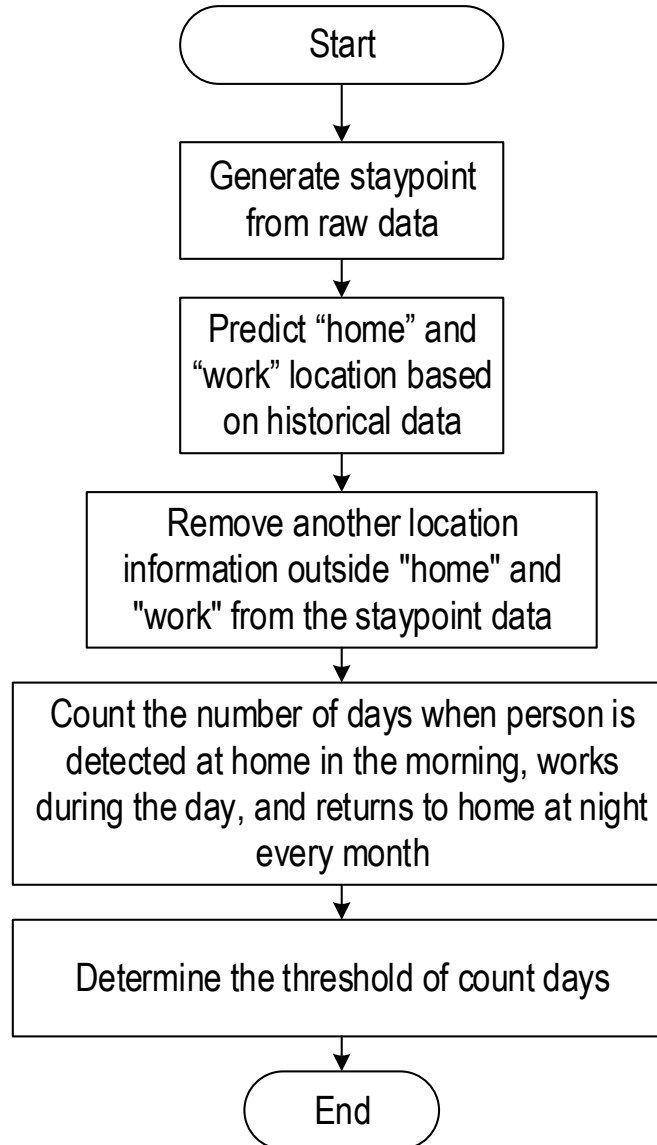
Based on geo-data to calculate all transactions of cellular subscriber in particular area

MODEL ORIGIN-DESTINATION

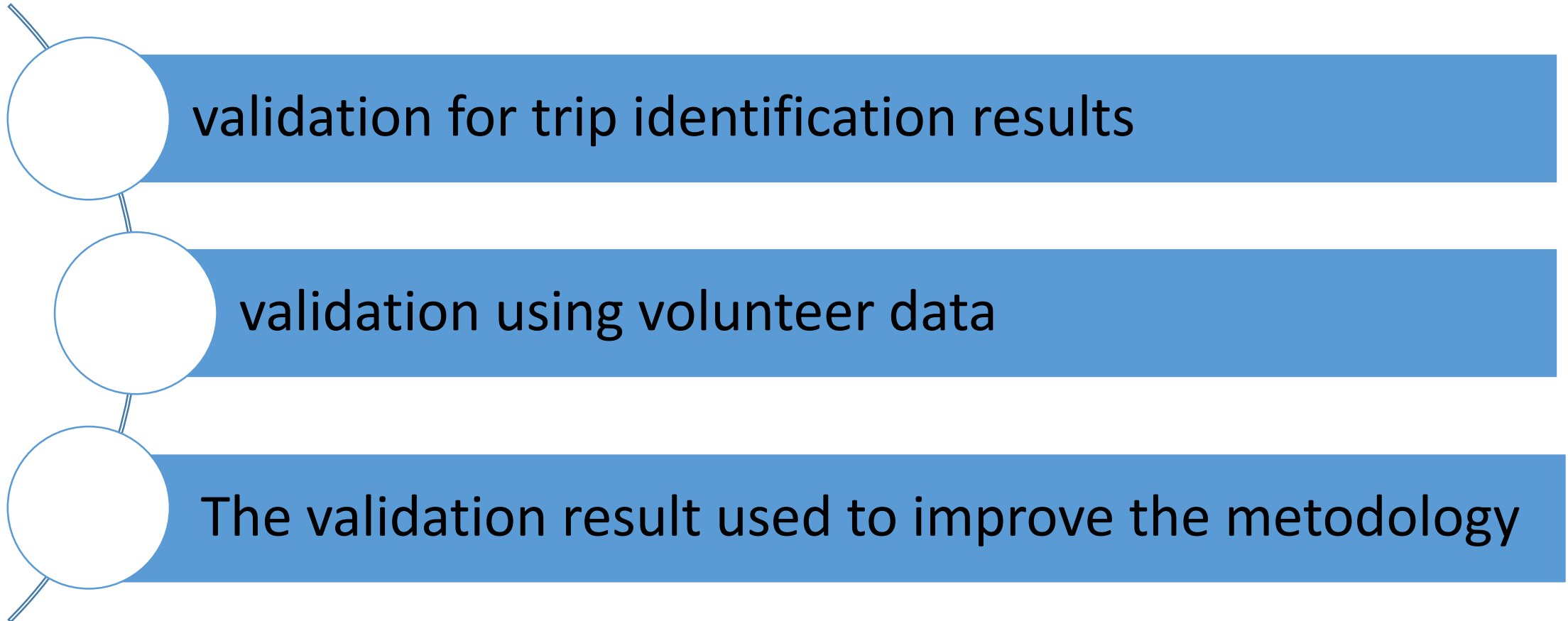


Trip in usual environment used to identify the commuter and circular actors

Algorithm to identify The Commuters



QUALITY ASSURANCE



Measuring Commuters Using Mobile Positioning Data

lat	long
-6,24839	106,9108
-6,24839	106,9108
-6,24511	106,9055
-6,24511	106,9055
-6,24511	106,9055
-6,24839	106,9108
-6,24511	106,9055
-6,24511	106,9055
-6,24839	106,9108

Using latitude longitude data, we can measure distances of origin and destination

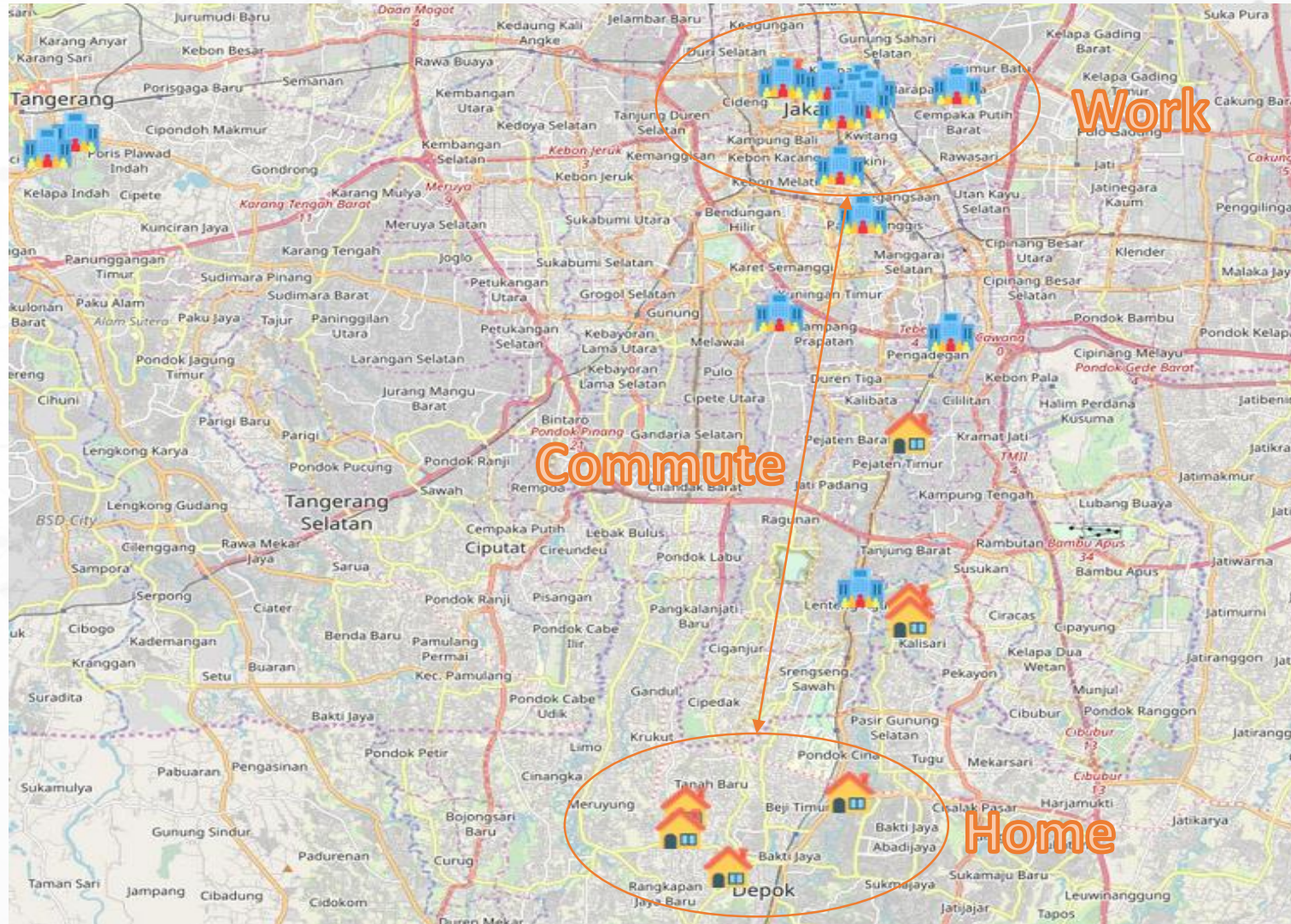
Using date and time, we can measure duration of the movements.

datetime
20171202171409
20171202211454
20171203011443
20171203011443
20171203011443
20171203012058
20171203012346
20171203012346

propinsi	kabupaten	kecamatan	kelurahan
DKI JAKARTA	JAKARTA TIMUR	MAKASAR	CIPINANG MELAYU
DKI JAKARTA	JAKARTA TIMUR	MAKASAR	CIPINANG MELAYU
DKI JAKARTA	JAKARTA TIMUR	DUREN SAWIT	PONDOK BAMBU
DKI JAKARTA	JAKARTA TIMUR	DUREN SAWIT	PONDOK BAMBU
DKI JAKARTA	JAKARTA TIMUR	DUREN SAWIT	PONDOK BAMBU
DKI JAKARTA	JAKARTA TIMUR	MAKASAR	CIPINANG MELAYU
DKI JAKARTA	JAKARTA TIMUR	DUREN SAWIT	PONDOK BAMBU
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DKI JAKARTA	JAKARTA TIMUR	MAKASAR	CIPINANG MELAYU
DKI JAKARTA	JAKARTA TIMUR	MAKASAR	CIPINANG MELAYU

Using local administrative units (LAU), we can know the movements between regions.

Measuring Commuters Using Mobile Positioning Data



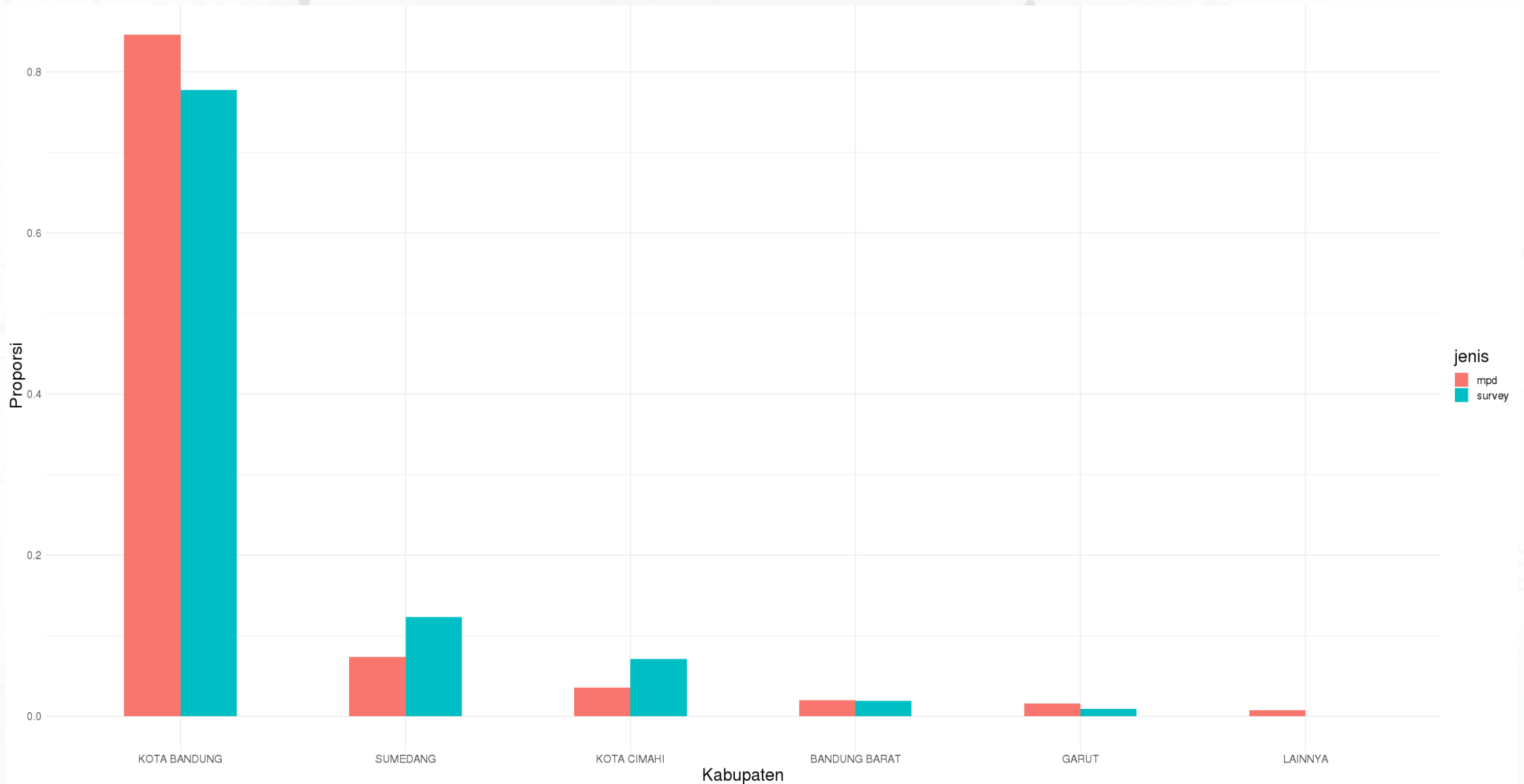
After usual environment identification, we can measure the distance between these points and measuring travelling time, we can predict vehicle type.

Comparison of Survey & MPD

	Survey	MPD
Region	Bandung Regency	Bandung Regency
Period	June, 2017	December, 2017
Unit Sample	Household Survey	Telkomsel Subscriber
Sample size	16.572	~ 2 million?

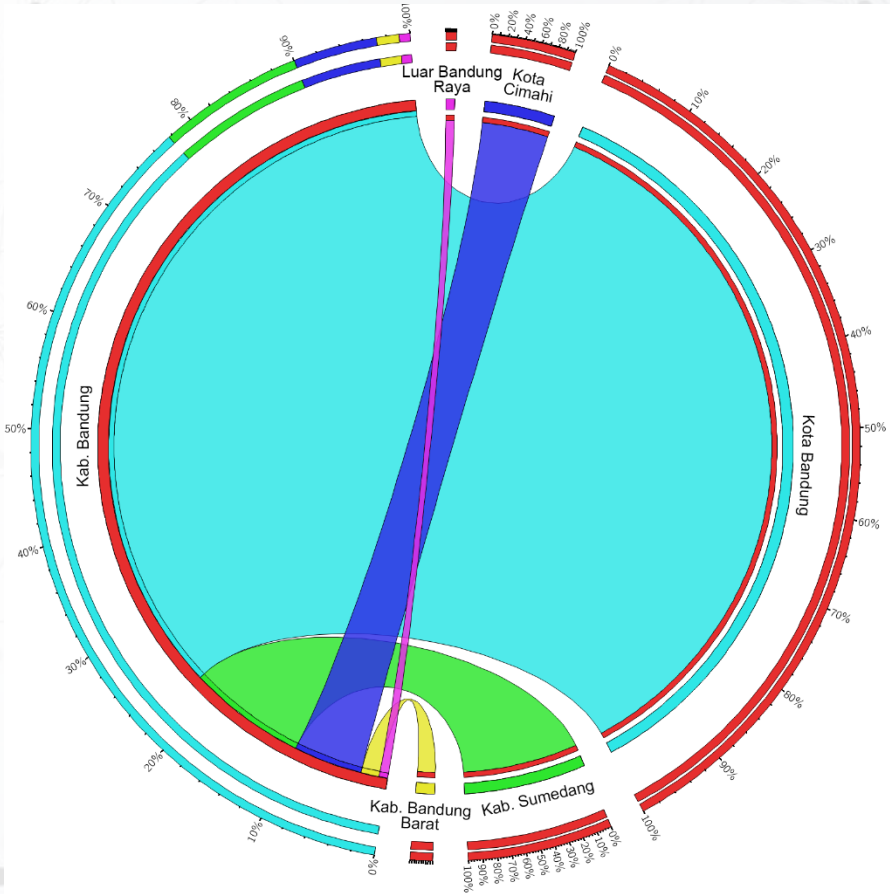
Commuter Estimation Comparasion using Survey vs MPD

Measuring Commuters
Using Mobile Positioning Data

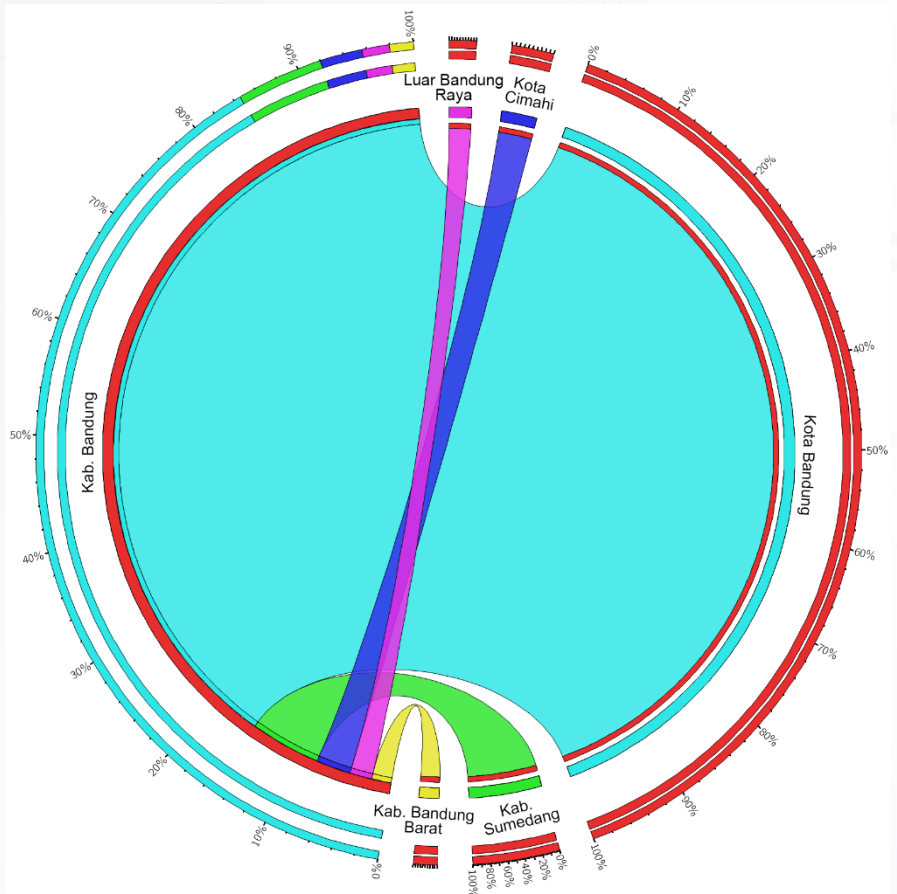


Commuter Estimation Comparison using Survey vs MPD

Measuring Commuters
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Commuter Survey

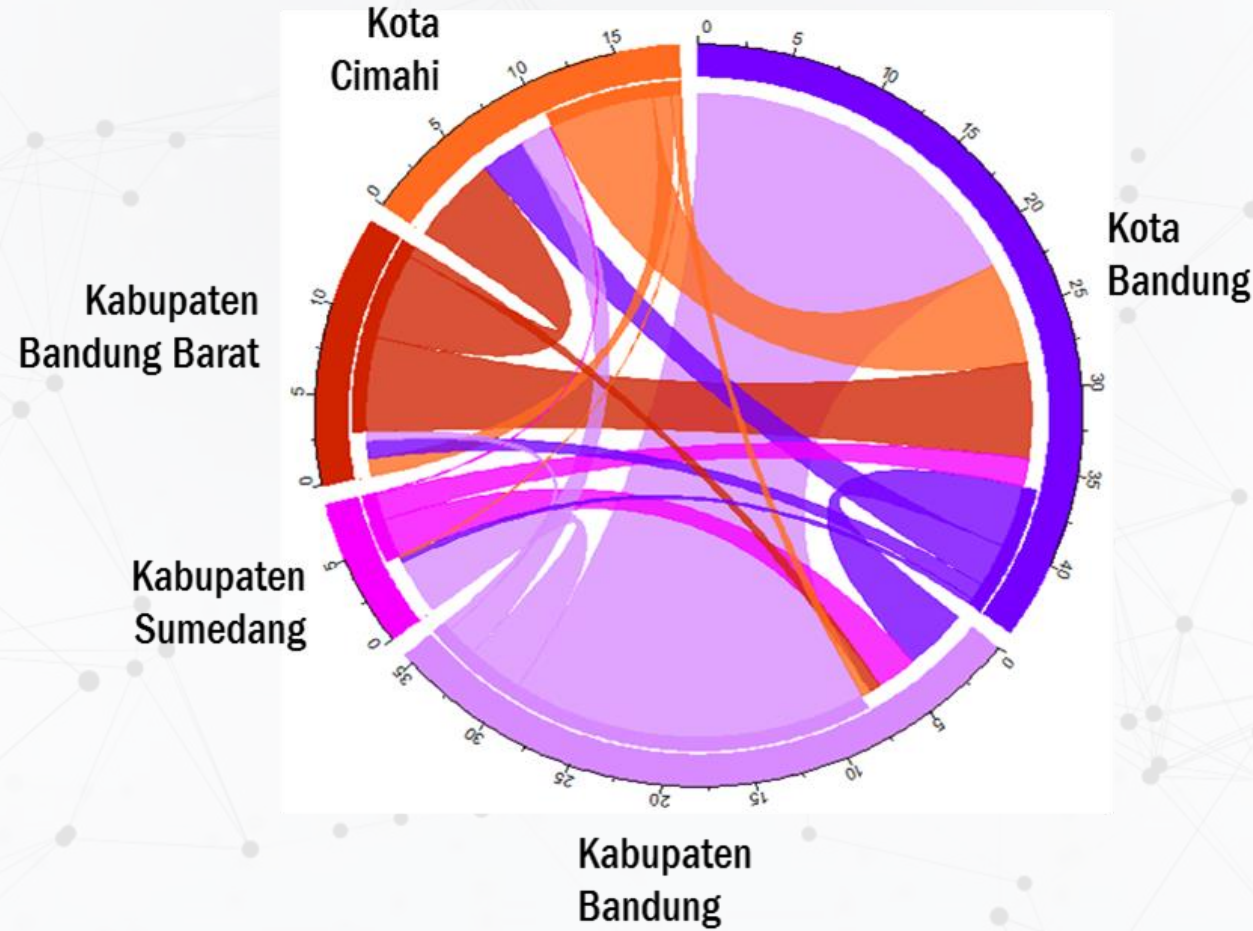


vs

MPD

Commuter Estimation Comparasion using Survey vs MPD

Measuring Commuters
Using Mobile Positioning Data



Future Action Plans using MPD

- **Focus Group Discussion under coordination of ministry of planning**
- **Continuing the cooperation and agreement with Telkomsel**
- **Signing MoU with Positium – Estonia**
- **Coordination with Ministry of Telecommunication and Information for gathering data from all provider and making data access free of charge**



MIGRATION
STATISTICS



Transnationalism VS Migration

*Transnationalism refers to a situation where a person has close ties to or is active in several countries (Schiller et al 1995)



MIGRATION
STATISTICS



Tracking Transnationalism with Mobile Telephone Data

1. How many **transnational** people are there originating from Indonesia?
2. How do they **travel** and **who** are they?
3. How should this new **information** on transnationalism be understood from the point of view of nation-state and territoriality?

ADVANTAGES AND LIMITATIONS



+ ADVANTAGES

1. MPD can describe movements between times
2. The longer the data series the better the accuracy produced
3. Near real time data



- LIMITATIONS

1. Boundaries issue
2. Privacy issue
3. Data authorization
4. Need to adjust concepts and methodologies with the characteristics of big data

Together
WE
Achieve
More

“
TERIMA KASIH
Thankyou
”



Sensus
Penduduk
2020